

8.75 pound (3.98 kg) and measuring 10.2 cm by 10.2 cm. A test film of ethylene vinyl acetate, containing 12% by weight vinyl acetate, served as the present release liner 10 (i.e., roll stability layer 14) and was taped to the surface of the inclined plane and a test film of each heat activated adhesive, S-HAA and M-HAA, was taped to a block. The S-HAA and the M-HAA films had an overall average surface roughness of about 13.5 microinches (0.000343 mm) and 39.2 microinches (0.000996 mm), respectively. Likewise, a test film of high density polyethylene served as the prior art release liner and was also taped to the surface of the inclined plane. For both the EVA and the HDPE test film, each block was placed on the inclined plane at 0°. The inclined plane was then raised until the block started to slide down the plane. The tangent of the angle of the inclined plane was then measured as the coefficient of friction of the two surfaces.

Referring to FIG. 3, when the adhesive tape assembly 20 has an overall thickness of about 0.052 inches (0.132 cm) and is wound into a roll 32, with the roll stability layer 14 contacting the HAA layer 26, the roll exhibits roll stability (i.e., the coils forming the roll 32 do not substantially telescope or fall apart when the roll 32 is held suspended along its outer circumferential edge) when the roll 32 has a diameter d that is at least about 20 times the width w of the adhesive tape assembly 20. This is the minimum diameter to width ratio at which roll stability problems have been experienced with rolls of prior adhesive tape assemblies comprising a double-sided adhesive tape, with a HAA side and a PSA side, and a release liner releasably bonded to the PSA side.

A typical example of an adhesive tape assembly 20, used to form a narrow roll 32 according to the present invention, has a width w of up to about 1 inch (2.54 cm), a thickness of about 0.052 inches (0.132 cm) and a length in the range of from about 36 yards (33 m) to about 144 yards (132 m) and, it is believed, even longer. For many applications, the present adhesive tape assemblies will have a width w of up to about 0.5 inches (1.27 cm). Prior adhesive tape assemblies having a length of about 36 yards (33 m), a thickness of about 0.051 inches (0.129 cm) and a width w of about 5 mm (0.196 inches) were wound into a roll 32 having a roll diameter to width ratio of about 49.7. Prior adhesive tape assemblies having a length of about 72 yards (65.8 m), a thickness of about 0.051 inches (0.129 cm) and a width w of about 0.25 inches (0.635 cm) were wound into a roll 32 having a roll diameter to width ratio of about 60. Prior adhesive tape assemblies having a length of about 108 yards (98.8 m), a thickness of about 0.051 inches (0.129 cm) and a width w of about 0.5 inches (1.27 cm) were wound into a roll 32 having a roll diameter to width ratio of about 33.

Various modifications and alterations to this invention will become apparent to those skilled in the art without departing from the scope and spirit of this invention. It should be understood that this invention is not intended to be unduly limited by the illustrative embodiments and examples set forth herein and that such examples and embodiments are presented by way of example only with the scope of the invention intended to be limited only by the claims set forth herein as follows and equivalents thereof.

What is claimed is:

1. An adhesive tape assembly comprising:
 - a double-sided adhesive tape comprising:
 - a front adhesive side comprising a heat-activated adhesive layer, and
 - a back adhesive side comprising a pressure-sensitive adhesive layer; and
 - a release liner comprising:

a front liner side comprising a release layer in contact with, bonded to and removable from said pressure-sensitive adhesive layer, and

a back liner-side comprising a roll stability layer which contacts said heat-activated adhesive layer when said adhesive tape assembly is formed into a roll, said roll stability layer comprising an ethylene vinyl acetate.

2. The adhesive tape assembly as set forth in claim 1, wherein said heat-activated adhesive layer has a contact surface which contacts said roll stability layer when said adhesive tape assembly is formed into a roll, and said contact surface has a smooth finish.

3. The adhesive tape assembly as set forth in claim 2, wherein said contact surface has an average surface roughness of up to about 26 microinches (0.00066 mm).

4. The adhesive tape assembly as set forth in claim 1, wherein said heat-activated adhesive layer comprises an olefinic material.

5. The adhesive tape assembly as set forth in claim 1, wherein said heat-activated adhesive layer comprises at least one of polyethylene and polypropylene.

6. The adhesive tape assembly as set forth in claim 1, wherein said pressure-sensitive adhesive layer comprises an acrylic foam pressure-sensitive adhesive.

7. The adhesive tape assembly as set forth in claim 1, wherein said release layer comprises at least one of a medium density polyethylene, a low density polyethylene, a linear low density polyethylene and an ultra-low density polyethylene.

8. The adhesive tape assembly as set forth in claim 7, wherein said release liner further comprises an intermediate layer disposed between said release layer and said roll stability layer, said intermediate layer comprising a high density polyethylene.

9. The adhesive tape assembly as set forth in claim 1, wherein said release layer has a contact surface, in contact with said pressure-sensitive adhesive layer, which is coated with a release material.

10. The adhesive tape assembly as set forth in claim 1, wherein said ethylene vinyl acetate has a sufficiently low content of vinyl acetate that said roll stability layer does not block with said heat activated adhesive layer.

11. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of less than about 28% by weight.

12. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 5% to about 24% by weight.

13. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 8% to about 20% by weight.

14. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 12% by weight.

15. An adhesive tape assembly comprising:

a double-sided adhesive tape comprising:

a front adhesive side comprising a heat-activated adhesive layer, and

a back adhesive side comprising a pressure-sensitive adhesive layer; and

a release liner comprising:

a front liner side comprising a release layer in contact with, bonded to and removable from said pressure-sensitive adhesive layer, and

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a back liner side comprising a roll stability layer which contacts said heat-activated adhesive layer when said adhesive tape assembly is formed into a roll, said roll stability layer comprising an ethylene vinyl acetate, wherein said roll stability layer further comprises an anti-blocking agent in an amount so that a coefficient of friction of said roll stability layer, when measured against said heat-activated adhesive layer, remains substantially constant.

16. The adhesive tape assembly as set forth in claim 15, wherein said roll stability layer comprises up to about 5% by weight of an anti-blocking agent based on the amount of ethylene vinyl acetate present.

17. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer has a coefficient of friction greater than about 0.4, when measured against said heat-activated adhesive layer.

18. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer has a coefficient of friction of greater than about 0.5, when measured against said heat-activated adhesive layer.

19. The adhesive tape assembly as set forth in claim 1, wherein said roll stability layer has a coefficient of friction of at least about 0.55, when measured against said heat-activated adhesive layer.

20. The adhesive tape assembly as set forth in claim 1, wherein said adhesive tape assembly has a width and is wound into a roll, with said roll stability layer contacting said heat-activated adhesive layer, and said roll has an outer circumferential edge, a diameter that is at least about 20 times said width and does not fall apart when held suspended along said outer circumferential edge.

21. An adhesive tape assembly in the form of a roll, comprising:

a double-sided adhesive tape comprising:

a front adhesive side comprising a heat-activated adhesive layer of a polyolefin heat-activated adhesive, and

a back adhesive side comprising a pressure-sensitive adhesive layer of a pressure-sensitive adhesive; and

a release liner comprising:

a front liner side comprising a release layer in contact with, bonded to and removable from said pressure-sensitive adhesive layer, and

a back liner side comprising a roll stability layer which contacts said heat-activated adhesive layer, said roll stability layer having a contact surface which has a coefficient of friction, when measured against said heat-activated adhesive layer, which provides an increase in roll stability to said adhesive tape assembly when formed into a roll,

said roll having, a width, an outer circumferential edge, a diameter that is at least about 20 times said width and does not fall apart when held suspended along said outer circumferential edge.

22. A release liner comprising:

a front liner side comprising a release layer having a first exposed contact surface bondable to and removable from a pressure sensitive adhesive layer, said release layer comprising a polyolefin homopolymer; and

a back liner side comprising a roll stability layer having a second exposed contact surface for contacting a heat activated adhesive layer, said roll stability layer comprising an ethylene vinyl acetate.

23. The release liner as set forth in claim 22, wherein said release layer comprises a polyethylene having a density of up to about 0.92 g/cc.

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24. The release liner as set forth in claim 22, wherein said release liner further comprises an intermediate layer disposed between said release layer and said roll stability layer, said intermediate layer having a higher density than said release layer.

25. The release liner as set forth in claim 22, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of less than about 28% by weight.

26. The release liner as set forth in claim 22, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 5% to about 24% by weight.

27. The release liner as set forth in claim 22, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content in the range of about 8% to about 20% by weight.

28. The release liner as set forth in claim 22, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 12% by weight.

29. A release liner comprising:

a front liner side comprising a release layer having a first exposed contact surface bondable to and removable from a pressure sensitive adhesive layer; and

a back liner side comprising a roll stability layer having a second exposed contact surface for contacting a heat activated adhesive layer, said roll stability layer comprising an ethylene vinyl acetate;

wherein said roll stability layer further comprises an anti-blocking agent in an amount so that a coefficient of friction of said roll stability layer, when measured against said heat-activated adhesive layer, remains substantially constant.

30. The release liner as set forth in claim 29, wherein said roll stability layer comprises up to about 5% by weight of an anti-blocking agent based on the amount of ethylene vinyl acetate present.

31. The adhesive tape assembly as set forth in claim 1, wherein said release layer comprising a polyethylene having a density of up to about 0.92 g/cc.

32. The adhesive tape assembly as set forth in claim 1, wherein said release layer comprising a polyolefin having a contact surface, in contact with said pressure-sensitive adhesive layer, wherein the contact surface is coated with a silicone or fluorocarbon release material.

33. The adhesive tape assembly as set forth in claim 21, wherein said release layer comprising a polyethylene having a density of up to about 0.92 g/cc.

34. The adhesive tape assembly as set forth in claim 21, wherein said release layer comprising a polyolefin having a contact surface, in contact with said pressure-sensitive adhesive layer, wherein the contact surface is coated with a silicone or fluorocarbon release material.

35. A release liner comprising:

a front liner side comprising a release layer having a first exposed contact surface bondable to and removable from a pressure sensitive adhesive layer, said release layer comprising a low density polyethylene, a linear low density polyethylene, or an ultra-low density polyethylene; and

a back liner side comprising a roll stability layer having a second exposed contact surface for contacting a heat activated adhesive layer, said roll stability layer comprising an ethylene vinyl acetate.

36. The release liner as set forth in claim 35, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 5% to about 28% by weight.

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37. The release liner as set forth in claim 36, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 12% by weight.

38. A release liner comprising:

a front liner side comprising a release layer having a first exposed contact surface bondable to and removable from a pressure sensitive adhesive layer, said release layer comprising a polyolefin coated with an outer layer of silicone or fluorocarbon release material; and

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a back liner side comprising a roll stability layer having a second exposed contact surface for contacting a heat activated adhesive layer, said roll stability layer comprising an ethylene vinyl acetate.

39. The release liner as set forth in claim 38, wherein said roll stability layer comprises an ethylene vinyl acetate having a vinyl acetate content of about 5% to about 28% by weight.

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40. An adhesive tape assembly comprising:
a double-sided adhesive tape comprising:
a front adhesive side comprising a heat-activated adhesive layer, and
a back adhesive side comprising a pressure-sensitive adhesive layer; and
a release liner comprising:
a front liner side comprising a release layer in contact with, bonded to and removable
from said pressure-sensitive adhesive layer,
wherein a roll stability layer comprising an ethylene vinyl acetate is in contact with
said heat-activated adhesive layer when said adhesive tape assembly is formed into a roll.
41. The adhesive tape assembly as set forth in claim 40, wherein said heat-activated
adhesive layer has a contact surface which contacts said roll stability layer when said
adhesive tape assembly is formed into a roll, and said contact surface has a smooth finish.
42. The adhesive tape assembly as set forth in claim 41, wherein said contact surface has
an average surface roughness of up to about 26 microinches (.00066 mm).
43. The adhesive tape assembly as set forth in claim 40, wherein said heat-activated
adhesive layer comprises an olefinic material.
44. The adhesive tape assembly as set forth in claim 40, wherein said heat-activated
adhesive layer comprises at least one of polyethylene and polypropylene.
45. The adhesive tape assembly as set forth in claim 40, wherein said ethylene vinyl
acetate has a sufficiently low vinyl acetate content that said roll stability layer does not block
with said heat activated adhesive layer.
46. The adhesive tape assembly as set forth in claim 40, wherein said roll stability layer
further comprises an anti-blocking agent in an amount so that a coefficient of friction of said
roll stability layer, when measured against said heat-activated adhesive layer, remains
substantially constant.

47. A roll stable liner for use with a double-sided adhesive tape, said liner comprising:
a front liner side having a first exposed contact surface comprising a polyolefin
homopolymer bondable to and removable from a pressure sensitive adhesive layer; and
a back liner side comprising a roll stability layer having a second exposed contact
surface for contacting a heat activated adhesive layer, said roll stability layer comprising an
ethylene vinyl acetate.

48. The liner as set forth in claim 47, wherein the polyolefin homopolymer of said first
exposed contact surface comprises a polyethylene having a density of up to about 0.92 g/cc.

49. The liner as set forth in claim 47, wherein the polyolefin homopolymer of said first
exposed contact surface comprises at least one of a medium density polyethylene, a low
density polyethylene, a linear low density polyethylene, or an ultra-low density polyethylene.

50. The liner as set forth in claim 47 further comprising an intermediate layer disposed
between said first exposed contact surface and said second exposed contact surface, said
intermediate layer having a higher density than the polyolefin homopolymer of said first
exposed contact surface.

51. The liner as set forth in claim 47, wherein said roll stability layer comprises an
ethylene vinyl acetate having a vinyl acetate content of less than about 28% by weight.

52. The liner as set forth in claim 47, wherein said roll stability layer comprises an
ethylene vinyl acetate having a vinyl acetate content of about 5% to about 24% by weight.

53. The liner as set forth in claim 47, wherein said roll stability layer comprises an
ethylene vinyl acetate having a vinyl acetate content in the range of about 8% to about 20%
by weight.

54. The liner as set forth in claim 47, wherein said roll stability layer comprises up to
about 5% by weight of an anti-blocking agent based on the amount of ethylene vinyl acetate
present.